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ARTICLE I. *Report of four additional cases of Stone in the Bladder, in which the operation of Lithotripsy was successfully performed.*
By J. RANDOLPH, M. D., Lecturer on Surgery, one of the Surgeons to the Pennsylvania Hospital, &c. &c.

Since my last report upon the subject of lithotripsy, made in the Number of this Journal for November, 1836, I have performed this operation in four instances. The two first of these (making my fourteenth and fifteenth cases) occurred in the Pennsylvania Hospital in this city, and the report of them is furnished by my friend, Dr. James A. M'Crea, who was at that period house surgeon to this institution.

The sixteenth case occurred in an old gentleman of this city, seventy-three years of age, who had been for a considerable period under the particular charge of Dr. H. M. Murtrie, and this gentleman has had the kindness to furnish the statement of this case. The seventeenth case is that of a young gentleman, also of this city, who was cured most happily in a very short period, as will be seen by the report.

The following is Dr. M'Crea's account of the two first cases:

"I trust the following cases will prove interesting to the readers of the American Journal, inasmuch as they are the first in which the complaint of stone in the bladder has been cured in the Pennsylvania Hospital by any other than a cutting operation.

"Within the last five years the instruments of M. Civiale and M.
No. XLI.—NOVEMBER, 1837.

Jacobson were employed in the treatment of several cases of calculus (not the most favourable, however,) without success, and great anxiety was felt by all those connected with the institution that the operation should be established upon its records by a favourable result.

"This, I am happy to state, has been accomplished in two cases; the latter, as will appear in its details, was one of the most unfavourable that could have possibly presented, and the successful treatment of which speaks volumes for the inestimable value of the operation, the case being one in which the gorget or scalpel could have offered very little hope of relief, thereby demonstrating the superiority of lithotripsy over any and every other method of treating urinary calculus.

"Before entering upon the first case it may be well to mention, as indicative of the strong feeling in favour of the operation among the people of our country, that Mr. Askine came to the city predetermined to submit to no other operation before he had tested this, and confident that he would shortly return to his family perfectly restored.

"**CASE XIV.**—Mr. Askine, aged 32 years, cabinet-maker by trade; of robust frame; cheerful disposition; good general health; admitted into the Hospital on the 26th of October, 1836. He had travelled from Pittsburg, where he has resided for the last 13 years, chiefly by water, with great comfort, very little exacerbation of symptoms being produced by the journey.

"The complaint had manifested itself about six months ago, (May last,) by the symptoms usually characterizing its early stages, and continued to advance without much distress for three months. Since that time he has been unable to retain his urine for a longer period than one to two hours, and towards the close of the day, after moderate exercise, this period was much shortened. He has suffered several times from acute inflammation of the bladder, which was subdued by rest, leeches, and other antiphlogistic treatment. He had also several attacks of irritation and inflammation about the sphincter ani, productive of great pain and inconvenience. With the exception of these occasions, he has superintended his business since his attack. The character of the urine has been turbid, occasionally a great deal of mucus and sediment accompanying its discharge; quantity very variable.

"*Oct. 27th.* Has had a restless night, passing his urine very frequently—hourly, almost; with a disposition to chilliness, to which it may be stated he has been unusually subject ever since the commencement of his disease. Pulse 92 per minute, with slight thirst and heat of skin. R. mixt. neut. \bar{z} ss. occasionally; tepid fomentations to perinæum.

"Oct. 28th. Dr. Randolph sounded the patient in my presence. The stone was readily detected at the neck of the bladder, and communicates to the instrument the feel of a soft calculus. After sounding, a little sand passed, and the patient had a well marked chill. The chill recurred upon the evening of the succeeding day, after which he was very comfortable until the day of the operation.

"On the 2nd of November, Dr. Randolph, in the presence of his colleagues, a very large assemblage of physicians, students of medicine, and gentlemen, who had been attracted by the novelty and extreme interest of the case, introduced the *brise-pierre articulé* of M. Jacobson into his bladder, seized and crushed the stone three several times. During the movements of the operator the patient did not exhibit any evidence of pain, and in reply to an inquiry relative to his sufferings, answered that he felt no inconvenience or unpleasant sensation. He walked from the operating theatre to an adjoining chamber, and about an hour afterwards made use of a warm bath. He expressed great relief from distress and pain, had no chill or fever, and passed his water but once during the night. On the following morning a large quantity of sand and a fragment of some size passed out, and during the day three or four distinct fragments of considerable size passed through the urethra, without pain or inconvenience. The patient, in fact, was unconscious of their passage.

"Nov. 5th. Some difficulty of passing urine arose from a collection of mucus and sand at the neck of the bladder, giving rise to some degree of pain. A chill followed the passage of the agglutinated mass.

"Since that time he has had no pain or other unpleasant symptom. Appetite excellent; takes exercise in the open air, and is fast regaining strength.

"Nov. 10th. Dr. Randolph sounded the patient with the instrument of M. Jacobson, and detected a small fragment, which he immediately broke, and it passed out in the afternoon. Dr. R. expressed the opinion that it would have passed out in a day or two without assistance.

"Discharged, November 16th, 1836, perfectly cured of every symptom of stone.

"Upon the third day after the first operation a small piece of wax, about the size of an ordinary buck-shot, passed from the bladder, being evidently the nucleus of the stone, as the larger fragments of the stone which had been passed corresponded to and closely fitted upon its surfaces. The patient could in no manner account for this singular occurrence, having never had any other instrument introduced into his urethra than a metallic sound.

"I believe no case has ever been recorded in which this usually protracted and painful disease was relieved so fully and unequivocally in a shorter time, but fourteen days having elapsed from the performance of the first operation to the discharge of this patient. Letters from him of a recent date entirely confirm his complete restoration to health and usefulness.

"**CASE XV.**—The subject of this case is a member of the medical profession, from a sister state; and the existence of disease of the bladder being of long standing, the account of the patient, Dr. Silas Tompkins, of New Bedford, Massachusetts, has been prefixed to the history of the operation, as detailed by himself upon entering the hospital.

"In July of 1832, (he says,) I suffered from an attack of paraplegia, commencing with a sensation of numbness in the left heel, and a partial loss of power over the bladder, so that I was obliged to make an effort of from half a minute to a minute before I could command its action. This state did not continue long without an increase of unfavourable symptoms; the sensation of numbness extended up to the knee, and in the course of two or three weeks my gait became clumsy and staggering. I soon lost the power of retaining or expelling my fæces, and was obliged to have constant recourse to the catheter to evacuate the bladder.

"I continued to walk, or rather hobble about, until September, when I lost all power of motion, and nearly all sensation below the sternum. About the 1st of November a fistula in ano was formed, which discharged copiously and reduced me very much, so that I kept my bed for eight months.

"In June, 1833, I so far regained my health as to retain urine for six or eight hours, and had a moderate command of the rectum.

"In the summer and autumn of 1834, however, it became necessary to introduce a catheter four or five times in the course of a single night, and it was about this time that blood was first observed to follow a discharge of urine, particularly after exercise in a carriage.

"The first attack of acute cystitis occurred in June, 1835. Great pain in the region of the bladder, along the course of the urethra; strangury, hemorrhage, &c., accompanied by a good deal of sympathetic fever, since which my bladder has never been free from disease, very irritable, sometimes but 20 or 30 minutes elapsing without an involuntary discharge; urine constantly morbid, containing large quantities of mucus, occasionally mixed with blood. Since this period the catheter has been constantly employed; and although but little retentive power remains, there is a slight expulsive power left.

'In the autumn of 1836 I was satisfied, after repeated attempts to detect the presence of stone with a sound, of the existence of a calculus of some size in my bladder, and immediately resolved to submit to lithotripsy; and accordingly wrote to Dr. Randolph in relation to my case, who advised my visiting Philadelphia and entering the Pennsylvania Hospital.'

'Such was the brief history given by this gentleman on the 13th of December, 1836, when he first came under my notice as a patient in this institution.

'Doctor Tompkins was sounded by Dr. Randolph on the 15th, and the stone readily found; it appeared to be very large, apparently nearly filling up the bladder. The bladder itself appeared very much thickened and irregular, diminished in size, and communicating to the sound a cellular arrangement, as if bands had been thrown across it, or subdivisions of its cavity had taken place. Upon being irritated it contracted spasmodically, with so much force that it was impossible to turn an instrument in it.

'The patient, it will be remembered, at this time had very little control over the passage of the urine; it generally passed involuntarily, notwithstanding which, however, it was discharged with considerable force, and from this circumstance Dr. R. was induced to hope that the fragments of stone would be passed without much difficulty.

'On the 21st of December, Dr. Randolph commenced the operation in the presence of a large assembly of professional and other gentlemen, by introducing the *brise-pierre* into the bladder, and without much difficulty caught and broke the stone twice. After this he was unable to seize the stone, owing, in a great measure, to the violent contraction of the bladder, rendering it almost impossible to expand the blades of the instrument. The patient bore the operation remarkably well, probably owing to the sensibility of the bladder being somewhat diminished. A few hours after the operation he had a chill, followed by fever, which passed off during the night by perspiration. The several succeeding days, calculous matter, about the same in quantity as usually follows the first operation under similar circumstances, was discharged with the urine. The stone was soft and evidently a phosphate of lime.

'On the 28th of December the operation was repeated with success, the stone twice broken, and subsequently a great deal of calculous matter with fragments of considerable size have been voided. No chill or other unpleasant symptom followed this operation.

'*January 2nd.* The operation was again performed, and upon this occasion a different form of the *brise-pierre* used. The stone was

readily caught and very satisfactorily crushed twice. No disagreeable effects supervened after this, the third operation upon the stone.

"*January 11th.* The stone was on this day twice caught and broken, and large fragments passed off for several days subsequently.

"*January 16th.* The instrument was introduced to-day and the same successful results followed. The stone is evidently much reduced in size. Large quantities of sand and smaller fragments were passed immediately after the operation.

"*January 25th.* The instrument having been introduced, four or five distinct fragments of calculus of some size, were caught and thoroughly crushed, a large quantity of calculous matter was extracted between the blades of the instrument, and the patient passed a much larger quantity of stone after this than after either of the former operations; some hemorrhage took place afterwards, but it soon ceased.

"*February 12th.* Upon sounding the patient this morning, two or three fragments were discovered at the neck of the bladder, which seemed to lie in cells, or dilated pouches; one of them indeed, a day or two previous, had passed into the urethra an inch or more in advance of the membranous portion, and gave rise to some irritation and a chill. An effort was made to extract it, but it was found to be so large in size, as to create apprehension lest an attempt to remove it would excite too much irritation, and it was therefore returned to the bladder. Two large fragments were then crushed without the slightest pain or inconvenience to the patient, and a large quantity of fine sand with six or seven fragments of large size passed during the following forty-eight hours.

"The operation was continued on the 23d and 27th of February, with similar favourable results.

"On the 9th of March, Dr. Randolph sounded the patient and could find but one small fragment remaining, which he was of opinion would have readily passed had not a little swelling taken place at the mouth of the urethra, thereby somewhat contracting its calibre. This fragment was therefore broken, and it passed off immediately after the operation. Although this operation did not occupy more than a minute, it occasioned a great deal of pain and some hemorrhage. The patient remarked after the operation, that his urethra had been unusually tender previous to the introduction of the instrument.

"A few days subsequent to this operation, a fragment of calculus made its appearance in the urethra, and Dr. Tompkins being very anxious to get rid of it, very imprudently passed a sound curved at its point, behind it, and in his efforts to draw it forward, pushed it through the urethra into the substance of the corpus cavernosum. In

this situation it gave rise to a great deal of swelling and irritation; finally exciting inflammation and suppuration, and requiring to be extracted externally, through an opening made into the abscess by a lancet. A swelling of the testicles, it should also be stated, took place, followed by inflammation and suppuration of the cellular texture of the scrotum. For the relief of this, free incisions were made into the scrotum, through which a large quantity of matter was discharged, the swelling gradually subsided and the Doctor entirely recovered from all these occurrences previous to his leaving the Hospital, which he did about the first of May, perfectly free from every symptom of stone, and able to retain his urine four or five hours without inconvenience. Dr. Tompkins returned home and published an account of his case in the Boston Medical and Surgical Journal, in which he states the fragments "were expelled very readily, till by imprudently attempting to extract some large pieces, I wounded the urethra, producing stricture for a time, which prevented any large fragments from passing out; otherwise I should have been cured much sooner."

CASE XVI.—*Reported by H. M. MURTRIE, M. D.* "The first time I was summoned by Mr. Wm. Y. Birch to see him professionally was in 1829. It was at night; his complaint diarrhœa, which yielded in a day or two to the usual remedies. In five or six weeks similar symptoms occurred, and he continued in this way till 1831, complaining of nothing but the singular and apparently periodical loose state of his bowels. About this time the intervals became shorter, so that not a week elapsed but he had an attack; and in the course of a few months scarcely a night passed that he was not compelled to rise five or six times in the course of the night. In this way did the disease continue to harass and debilitate him, with occasional but short intervals of relief, until his death, in spite of the various plans of treatment successively adopted by myself and others. In 1831 he began to exhibit symptoms of dysuria, trifling at first, but soon increasing in frequency. Here, as in the diarrhœa, all attempts to effect a cure were in vain; and, by the commencement of 1832, I had made up my mind that these new symptoms originated from the combined effects of a relaxed state of the sphincter of the bladder and an enlargement of the middle lobe of the prostate. It was about this time that, on his return from a ride into the country with a friend in his carriage, he passed a quantity of bloody urine, which alarmed him excessively, and induced me to suspect there might be a stone in his bladder. Still there was *no pain*. I closely and repeatedly questioned him on this point; all that he complained of was a *sensation*, as he described it, in the glans penis. An eminent surgeon of this city was now applied to, who

sounded him with great care twice, at an interval of several days. *No stone could be found.* Convinced by this that my former opinion was correct, and taking into consideration the age of the patient, at that period 68, I confined my views of treatment to a palliative course, prescribing for symptoms as they arose, and endeavouring to keep up his general health.

"In this state matters continued with but little variation till April, 1836, when he had a chill, followed by high fever, and which for several days threatened to terminate fatally.

"In the beginning of April, 1837, at his request, I had a consultation with Dr. Randolph on his case, at which it was agreed that he should be sounded again by that gentleman. This was done on the 13th, and to my great surprise the instrument struck directly against a calculus, which, from the ring it sent forth, was judged to be a hard one and of tolerable size. The operation of lithotripsy was of course determined on, and accordingly, on the

"17th April, Dr. Randolph, in presence of Dr. Kirkbride, myself, and a pupil of the operator, introduced the *brise-pierre articulé* of M. Jacobson without the slightest difficulty, (the bladder of the patient being not very irritable and his urethra large,) seized the stone, and broke it four times. The patient complained but very little, and certainly experienced but very little pain. No constitutional disturbance ensued; fragments of the stone, of a red colour, apparently formed of uric acid, came away during the next three days, without any pain, and, in fact, without the knowledge of the patient.

"24th. Dr. Randolph repeated the operation in my presence, and with similar success; caught the stone and crushed it four times. No constitutional disturbance ensued; and the patient, on rising from his bed, observed *with a laugh*, "it was all very fine, but he would be very glad to get rid of us." He suffered *no pain at all* from this operation. Calculous matter, as before, came away during the next three days.

"29th. The operation continued by Dr. Randolph in my presence; the instrument caught the stone without difficulty and crushed it. On this occasion the bladder was much more irritable than at any preceding period, contracting firmly on the *brise-pierre*, so that the stone was crushed but twice. Several large fragments of the calculus, accompanied by smaller ones, came away in a few hours. In the afternoon the patient had a chill, followed by fever. Ten grains of Dover's powder produced a free perspiration in the course of an hour; the fever left him, and he passed on the whole a comfortable night.

"May 7th. The *brise-pierre* again introduced by Dr. Randolph in

my presence. The stone caught and crushed with the greatest facility; fragments passed for the next two or three days.

"*May 14th.* Operation repeated by Dr. Randolph, very successfully; the stone caught and crushed four times in two or three minutes. No apparent suffering on the part of the patient. Fragments pass as usual. The outer portions or surface of the stone *as smooth as if glazed*.

"*May 21st.* Operation continued successfully; stone caught at once and crushed four times. No pain complained of by the patient. Fragments pass away as usual.

"*May 25th.* About midnight Mr. Birch was seized with a spasmodic affection of the throat, accompanied with considerable difficulty of breathing and total inability to expectorate. By daylight the remedies I exhibited partially relieved him, and he expectorated freely. He however complained of great weakness, and observed he must have had 'an attack of *grippe*.' There being no fever or uneasiness in the bladder mild tonics and nourishing diet, frequently repeated, were prescribed. The debility, however, increasing, Dr. Jackson was called, in consultation with Dr. Randolph and myself. A minute and careful examination of the case by Dr. Jackson eventuated in his coinciding with Dr. R. and myself in the opinion, that Mr. Birch's condition was not in the least dependent upon the operation of lithotripsy that had been performed upon him; Mr. Birch himself repeatedly declaring that he had no uneasiness or pain in the bladder, and that he felt satisfied he should soon be rid of the stone altogether. From this moment, in spite of the united efforts of his physicians, he gradually sunk; the power of deglutition became impaired, and on the 2nd of June, 1837, at 7 o'clock in the morning, he expired without a struggle—the only one of his family, so far as he can recollect, that had ever attained an equal age with himself, 73 years; his father, as I have often heard him say, dying of *old age*, many years his junior."

I subjoin to this statement a letter which I received from my friend Dr. Samuel Jackson, in relation to this case; and also an account of the autopsy, drawn up by my friend Dr. J. Pancoast.

My dear Doctor:—It may be satisfactory to you to have from me a statement of the last illness of your patient, Mr. Wm. Y. Birch, whom you relieved of a urinary calculus by the operation of lithotripsy.

On the 26th of May Dr. M'Murtrie requested me to visit Mr. Birch, in consultation with you and himself. The Doctor mentioned that Mr. Birch had been attacked suddenly in the night with cough and difficulty of breathing, and that my attendance was desired in consequence of the appearance of this new train of symptoms.

At my visit the patient was found very much depressed in his spirits. He expressed himself despondingly, and was impressed with a belief he should not recover. His pulse was feeble; he complained of a sore throat, had great difficulty in swallowing, had a harassing cough, with a viscid, tough expectoration. He had no difficulty with the urinary apparatus; the urine was retained for hours without pain or uneasiness, and voided with the greatest ease. It was evident he was labouring under an attack of acute catarrh or influenza.

It is not necessary to detail the course of the symptoms. It will be sufficient to state that until the close, which took place on the night of June 1st, they varied only in degree. They were confined exclusively to the respiratory, digestive, and circulatory apparatus. No complaint was made or difficulty occurred in the performance of the function of urination.

I may add further, that Mr. B.'s constitution had been enfeebled by a chronic diarrhoea of some years standing. He consulted me respecting it about four years since. With respect, yours truly,

Philadelphia, Aug. 17, 1837.

SAMUEL JACKSON.

Dear Sir:—I transmit you an account of the autopsy of Mr. Birch, which, from the hurry of the occasion, I was not able to carry farther than into the condition of the pelvic and abdominal viscera. The subject was very obese, and presented, on opening the abdomen, a small omental umbilical hernia, which was not strangulated or inflamed.

The stomach healthy, with some little redness of the mucous membrane. Liver, pancreas, spleen, and small intestines, generally healthy. The colon presented a considerable hypertrophy of all its coats except the outer. A great number of small sacs or pouches were found throughout its whole extent, but most abundantly on the side of the mesocolon; 65 of these could be counted on a foot of intestine taken from the middle of the transverse portion of the colon, and 43 on an equal extent taken from the sigmoid flexure, the smallest of which received the end of the handle of the scalpel, and the largest the end of the forefinger. The pouches were of various lengths, from a few lines to near an inch, and about one-fourth narrower at their orifice in the intestine than at their free extremity. They appeared to be enlarged follicles, which in their developement had made a sort of hernial protrusion between the circular muscular fibres. These fibres could be traced around the margins of the orifices, and gave to the touch the sensation of a ring. The mucous membrane of many of the larger pouches was much thickened, softened, and of a very dark slate colour. The colon contained a moderate quantity of rather

solid fæces; plugs of which, of still greater density, were found sticking into almost all of the pouches above described. These completely filled the pouches, and projected obliquely upwards, from a half to three-quarters of an inch into the cavity of the intestine. The largest of these plugs, when drawn out, resembled in shape and size the first phalanx of the thumb, the rounded end buried in the pouches, and of the same dark hue as its mucous membrane. These pouches were largest and most numerous, and the plugs the most solid, in the transverse and sigmoid portions of the colon. In each of these portions, for the extent of $2\frac{1}{2}$ or 3 inches, the mucous membrane was perfectly dry, of a polished appearance, and much injected. The membrane elsewhere was healthy, except near the cœcum, where it was softened and slate coloured in patches. The rectum was healthy. The bladder contained a few ounces of slightly turbid urine, and was hypertrophied in all its coats to nearly twice their natural thickness.

The mucous membrane presented no other change, except at the lower half of the bladder, where it was of a dark slate colour, though of firm consistence, with a spot the size of a quarter dollar in the centre of the *bas fond*, where it was slightly red and injected—appearances apparently produced by four or five small fragments of stone which rested upon it. The slate colour terminated by an abrupt line at the base of the prostate gland. The bladder exhibited no evidence of recent injury, and none but the usual appearances resulting from the chronic irritation produced by stone. The middle lobe of the prostate was of its natural size; the two lateral lobes enlarged to $2\frac{1}{2}$ times their natural dimensions. Urethra healthy. Both kidneys somewhat hyperemic and soft; the capsular coat stripped off much more readily than usual, as though the organs had been macerated. On the back part of each kidney, below the capsular coat, was found, half imbedded in the substance of the organs, a transparent cyst of serum or hydatid, holding about two ounces. The two cysts were exactly similar in appearance and position. In the right kidney were three others, of the size of marbles. The mucous membranes of the pelvis and ureter of each kidney seemed healthy. Yours, very sincerely,

Philadelphia, June 6, 1837.

J. PANCOAST.

CASE XVII.—May 7, 1837, I commenced the operation of lithotripsy on Mr. R. H., of Philadelphia, merchant, aged 27 years. Mr. H. had been afflicted with the complaint for about six months. For several years previous he had been in the habit of occasionally passing calculous matter along with his urine. During this period he was attacked with a stricture in his urethra, and to this cause in all proba-

bility may be attributed the lodgment of the stone in the bladder. Having dilated the urethra to its ordinary size, on the date mentioned, I introduced the *brise-pierre* into his bladder, in the presence of my brother, Dr. Charles Randolph, and caught the stone immediately and crushed it, without the slightest difficulty. Upon withdrawing the instrument, I ascertained that the stone was of a whitish colour and quite soft, having the appearance of a magnesian phosphate. The patient suffered so little pain from this operation, that I had caught the calculus and crushed it before he was aware that the instrument was introduced into his bladder. Soon after the operation he voided a considerable quantity of calculous matter.

May 14th. I repeated the operation, caught the stone four times and crushed it without any difficulty. This operation did not cause the least constitutional disturbance; soon after its performance he discharged the usual quantity of calculous matter. A few days subsequently to this operation, Mr. H. informed me that he could void his urine without any pain or difficulty; he was also able to retain it for several hours longer than he could do previous to the operation. I now examined the bladder with the greatest care on several different occasions, but could not detect any calculus remaining in it.

This patient, it will be perceived, was cured in the space of one week by two operations with the *brise-pierre*, without suffering the least inconvenience or constitutional irritation.

Before concluding this paper it may not be amiss to notice the accident met with by Mr. Roux, recorded in the last number of this Journal, p. 515. This surgeon, in attempting to extract a large fragment of calculus through the urethra by means of the *brise-pierre*, (it is not mentioned whose *brise-pierre*,) the instrument became so fixed in the urethra that it could not be moved either backwards or forwards, and it became necessary to make an incision into the urethra and extract the fragment through this opening before the instrument could be withdrawn. This accident cannot be at all urged as an objection to lithotripsy, inasmuch as the attempt to extract the fragment in this manner was entirely gratuitous on the part of Mr. Roux. We are free to confess that we have often felt tempted to extract fragments of a certain size by means of the instrument, under similar circumstances, with the view of expediting the cure. Such attempts, however, cannot be too strongly reprehended; not only on account of the danger which is thereby incurred, but inasmuch also as a portion of the stone so circumstanced may be crushed by merely closing the instrument, after which the fragments will readily be discharged.

Philadelphia, August 25, 1837.